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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/080,909	05/19/1998	GEORGE ISHIKAWA	1075.1013-CC	9908

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EXAMINER

MOSKOWITZ, NELSON

ART UNIT PAPER NUMBER

3663

DATE MAILED: 10/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/080,909

Applicant(s)

ISHIKAWA ET AL.

Examiner

Nelson Moskowitz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 164-184 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 164-184 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 23.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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1. Applicant's letter received July 14, 2003 has been entered and the references listed on the IDS received therewith have been considered. It is noted that these references cited by Applicant are all published after Applicant's earliest priority date.

2. The text of those section of Title 35 U.S. Code not included in this action can be found in a prior Office action.

3. Claims 164-184 are again rejected under 35 U.S.C. 103(a) as being unpatentable over Antos et al when taken with the Kanamori OEC article. (Please note that the specific reference constituents cited herein are done so for the convenience of the Applicant and are in no way intended to be limiting. The references should be considered in their entirety.)

In determining obviousness, the following factual determinations are made:

- a. first, the scope and content of the prior art;
- b. second, the difference between the prior art and the pending claims;
- c. third, the level of skill of a person of ordinary skill in the art; and,
- d. fourth, whether other objective evidence may be present, which indicates obviousness or nonobviousness. Graham v. John Deere Co., 282 U.S. 17-18, 148 USPQ 459, 466-67(1966).

Objective evidence includes a long felt but unmet need for the claimed invention, failure of others to solve the problem addressed by the claimed invention, imitation or copying of the claimed invention, and commercial success due to the features of the invention and not other factors. See e.g., Simmons Fastener Corp. v. Illinois Tool Works, Inc., 739 Fed. 1573, 1574-76, 222 USPQ 744, 745-747 (Fed. Cir. 1984).

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Examining the scope and content of the prior art we find the following:

a) Antos et al discloses (Fig. 14) a multi-stage optical amplifier including a first amplifier (OFA-2) amplifying a signal, a dispersion compensator (DC fiber) given to the amplified optical signal, and a second amplifier (OFA-3) amplifying the dispersion compensated optical signal. Note that the term “multi-stage” is defined as occurring in more than one stage. Therefore, the system of Fig. 14 is “multistage”. Furthermore, OFA-2 is operated in conjunction with the components placed within the dotted line box of figure 14 of this reference, and therefore the system is “multi-stage”.

In addition, Antos et al discloses (col. 2, lines 49-54) discloses that dispersion flattened fibers also have the benefit of a reduced slope around the zero crossing, thereby enabling low dispersion transmission over a wide range of wavelengths near the transmission wavelength, and cites the Okamoto et al U.S. Patent No. 4,372,647 for such teaching. This patent elucidates (see, inter alia, col. 2, lines 58-62; column 4, lines 48-57; col. 6, lines 39-41) Anto’s recitation and shows the benefit of WDM transmission with fiber optic amplifiers as providing substantially increased bandwidth, a highly sought desideratum in this art.

b) The latter cited article is exemplary of the well known prior art use of WDM signaling as it provides propagation of simultaneous signals, thus increasing bandwidth and the amount of information which can be transmitted at one time, and would be used for flexible upgrading. It is also cumulative to the disclosure of Antos et al.

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Secondly, under Deere, the difference between this prior art and the pending claims lies in the combination of WDM signal transmission with the DC fiber between amplifiers as disclosed by Antos et al.

Third, under Deere the level of ordinary skill in this art may be determined by the analysis of the Court as set forth in Environmental Design Ltd. v. Union Oil Co. 713 F.3d 693, 218 USPQ 865-69 (Fed. Cir. 1983) cert. denied, 464 U.S. (1984), where the court listed these factors relevant to the determination of the level of ordinary skill: type of problems encountered in the art, prior art solutions, rapidity of innovations, sophistication of technology, and educational level of the active worker in the field.

The types of problems encountered in the art involved signal dispersion and the loss of power due to the use of DC fibers. Innovation in this field has been very fast as can be seen from virtual birth of this field in the 1970's, to its present highly complex and sophisticated status.

Prior art solutions include using DC fibers and plural EDF amplifiers operating in a WDM mode in a single multistage system .

Skilled artisan generally have graduate level education and over seven (7) years of experience, as can be seen from published articles in the major journals of this field. See, inter alia, the references of record.

To date, no secondary consideration (objective evidence) has been presented. Therefore, as the aforesaid prior art teaches the increased bandwidth benefits of using WDM signaling, the

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use of WDM signals in a multiple amplifier system with DC fiber between the amplifiers would have been obvious to one skilled in this art.

A further indication of the obvious nature of the aforesaid combination is the expectancy of the beneficial results from using WDM, DC fibers, and plural amplifiers. This follows just as unexpected beneficial results would be evidence of unobviousness.

As the aforesaid prior art is known by optical physicists to provide the respective benefits and improvements as set forth above, the physicist would have been led to make the obvious combination of these teachings in order to obtain the benefits this prior art taught and an artisan would typically readily recognize.

It is noted that an artisan would generally look to optimize signal communication systems which would otherwise carry only a single frequency. Such optimization ordinarily leads to lower costs, and better signal transmission in a very competitive business.

As the aforesaid prior art is known by optical physicists to provide the respective benefits and improvement as set forth above, the physicist would have been led to make the obvious combination of these teachings in order to obtain the benefits this prior art taught and an artisan would typically readily recognize.

4. Applicant's arguments have been carefully considered and not found convincing. First of all, Applicant argues that Antos et al does not disclose a multi-stage amplifier. As a "stage" is generally defined as one of a series of items connected in tandem, or in a fiber optic circuit it is defined as a point in the sequence of circuitry that a signal must pass through.

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Therefore, in a fiber optic amplifier it is a step of amplification. In consequence, OFA-1, OFA-2 and OFA-3 are stages of an optical amplifier.

It appears that Applicant has not read this limitation in its broadest reasonable sense when read by an artisan.

Applicant's argument that Antos et al teaches away from WDM usage is not convincing. Antos et al teaches both the benefits of its figure 14 multistage fiber amplifier, and discloses (col. 2, lines 49-54) dispersion flattened fibers also having the benefit of reduced slope around the zero crossing, thereby enabling low dispersion transmission over a wide range of wavelengths near the transmission wavelength. This provides the improvement of broadband operation which increases the number of signals transmitted together and lowers total cost.

Furthermore, the "Fiber Optics Standard Dictionary" at page 602, defines WDM as "In fiber optics when referring to light waves, multiplexing that is similar to frequency-division multiplexing, a multiplexing system in which the available transmission wavelength range is divided into narrow bands and each is used as a separate channel." Thus, although Kanamori may also be referring to multiplexing pump and signal wavelengths onto the fiber, this does not detract from the general disclosure of WDM usage.

5. In light of Applicant's citation of references which are not prior art but are used to definitions, the following references which are prior art are cited. The Chraplyvy et al patent is cited to show prior art (see, inter alia, figure 1) WDM signal transmission through a fiber optic system using optical amplifiers. In addition, this reference teaches the use of WDM systems with

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amplifiers and DS fibers (col. 9, lines 4-27). The Desurvire article also shows prior art (page 118) WDM optical fiber systems using doped fiber amplifiers.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.



NELSON MOSKOWITZ
PRIMARY EXAMINER